

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-3, 5, 7-30, 32 and 33-37 are pending, Claims 1-3, 5, 7-16, 19-24, 26-30 and 32 having been amended by way of the present amendment and Claims 33-37 newly added. New Claims 33-37 correspond with Claims 2, 5, 8, 11 and 13 and therefore no new matter is added. Claim 6 has been canceled by way of the present amendment. Claims 4 and 31 have previously been canceled.

In the outstanding Office Action Claims 5, 7, 13, 16, 23 and 27 were rejected under 35 U.S.C. § 112, second paragraph; Claims 1-3, 5, 7-13, 16-25, 27-29 and 32 were rejected as being unpatentable over Cao et al. (U.S. 6,647,005, hereinafter Cao) in view of Terry et al. (U.S. 6,587,697, hereinafter Terry); Claim 6 was rejected as being unpatentable over Cao, Terry and in further view of Tsunehara et al. (U.S. 7,006,463, hereinafter Tsunehara); and Claims 14 and 15 were rejected as being unpatentable over Cao, Terry and in further view of Kim et al. (U.S. 7,450,611, hereinafter Kim).

The undersigned appreciatively acknowledges the courtesy extended by Examiner Daniel in holding an interview with the undersigned on March 16, 2011. As discussed below, during the interview, claim amendments were discussed and compared with the asserted prior art.

Claims 5, 7, 13, 16, 23 and 27 were amended consistent with 35 U.S.C. § 112, paragraph 2. Similar amendments were made to Claims 1, 26 and 28 to avoid these claims being construed under 35 U.S.C. § 112, paragraph 6.

As discussed, each of the independent claims has been amended to include the feature of Claim 6 and refer to update control information. As further amendments, not discussed in the interview, but believed to further clarify the claims, the update information is consistently

claimed as “update control information”. Also, each independent claim has further been amended to clarify that the combined user equipment specific update control information is transmitted to/received by the plurality of user equipment.

Accordingly, in the case of amended Claim 1, for example, an apparatus has a processor that combines user specific update control information for a plurality of user equipment to generate combined user equipment specific update control information. An encode processor is included wherein forward error correction coding is applied to the combined user equipment specific update control information for the plurality of user equipment. A transmitter transmits the encoded combined user equipment specific update control information in a common physical control channel received by the plurality of user equipment. Non-limiting support is found in [0131] and [0154], and therefore no new matter is added.

By combining the user equipment specific update control information and then forward error correction coding the combined user specific update control information for the plurality of user equipment, an advantage offered by the apparatus of Claim 1 is that it allows for the reception of user specific update information in a reliable manner and at an occurrence rate that would support the different user equipment without compromising system performance, or requiring undue processing capacity in the user equipment.

It is believed that none of the asserted prior art teach or suggest all of the features of amended Claim 1. With regard to amended Claim 1, there are two points that are particularly relevant with regard to distinguishing the asserted prior art: (1) that the transmitting apparatus in the cellular communications system combines “user specific update control information for a plurality of user equipment”, and (2) forward error correction coding as applied to the combined user equipment specific update control information for the plurality of user equipment. The “update control information” is relevant, in the context of being combined

user equipment specific update control information, since the update control information is combined for multiple user equipment prior to being sent to the multiple user equipment. Also, forward error correction coding is applied to the combined user equipment specific update control information.

These features distinguish conventional code division multiple access (CDMA) systems such as WCDMA, that transmit update information from a base station to user equipment on a rapid basis (about 1,500 times per second) without forward error correction being applied. In these conventional systems, the rapid issuance of update information is needed to assist in maintaining uniform signal reception levels at the base station of received user equipment transmissions so as to avoid any stronger transmissions from suppressing weaker ones. Moreover, by maintaining uniform received signal power levels from the different user equipment, the lack of complete orthogonality between the transmissions from the user equipment can be mitigated so as to avoid co-channel interference issues and suppression of weaker received signals. In the industry this is typically known as the “near-far problem”.

Because the base stations send the update information very frequently, the user equipment is not able to perform forward error correction properly due to processing delay if the user equipment was required to decode the update information 1,500 times per second. Generally it is believed that no forward error correction is required because if one of the update information transmissions is received in error, a next one will quickly inform the user equipment of the correct update information.

For these reasons above, conventional CDMA systems such as WCDMA systems do not send update information with forward error correction because any attempt to do so would greatly complicate processing load budgets of user equipment.

As discussed in the interview, Cao is directed to a WCDMA system that would transmit the update information without forward error correction coding applied thereto. Cao describes

a WCDMA system that multiplexes packet data onto a single channel. Consistent with conventional WCDMA systems, control information is transmitted in every slot (column 4, lines 6-7). From the cover figure, it is evident that no forward error correction coding is applied to the control information, as is evident from the absence of any description otherwise, and that each user equipment is provided with two data bits and no redundancy bits. Forward error correction coding is effective at correcting transmission errors because it takes advantage of redundant information used when encoding the raw information. Cao describes an otherwise conventional WCDMA system, that combines some control information but sends the control information at the same rapid rate of a conventional WCDMA system, and without forward error correction coding.

Moreover, the hypothetical application of forward error correction coding to the update information would render Cao unfit for its intended purpose, as WCDMA requires the rapid transmission of the update information so as to avoid having unbalanced reception power levels at a base station and needs to be received/decoded by user equipment with limited processing resources.

Also discussed during the interview, Terry, is also directed to a CDMA system, and does not apply forward error correction coding to the update information. Terry is also directed to a CDMA system that would also manage the power levels of user equipment transmissions as received by a base station. Although the Office Action refers to column 4, lines 1-4 for example in Terry as being relevant, this language in Terry describes the combination of quality margin QM information and interference output information (Icc) that can be encoded into a single parameter. However, this description relates to merely combining the data into a single parameter, without forward error correction coding. Also, the expressed purpose in the language cited by the Office Action is to further reduce the downlink signaling overhead. If forward error correction were applied, it would increase the overhead since redundancy would

be added to the transmitted information. Accordingly, Terry should not be viewed as teaching combined update information that is subjected to forward error correction coding. Moreover, subjecting the QM and lcc in Terry to forward error correction coding would be contrary to the stated objectives stated in Terry.

Moreover, if Terry were adapted to include this feature, it would have an opposite effect of the objective in Terry, which is to reduce signaling overhead. Thus, Terry teaches away from the invention of amended Claim 1.

Tsunehara does not apply forward error correction coding to the update control information. Therefore, it is respectfully submitted that no matter how Cao, Terry and Tsunehara are combined, the combination would not teach or suggest all the features of amended Claim 1.

Furthermore, the hypothetical combination of these three references to address the newly added features to Claim 1, for example, would render these systems unfit for their intended purposes.

In light of the above, it is respectfully submitted that Claim 1, as amended, patentably defines over the asserted prior art.

Moreover, Claim 6 has been incorporated into Claim 1, and therefore because Claims 2-3, 5, and 7-25 depend directly or indirectly from Claim 1, it is respectfully submitted that these claims also patentably define over the asserted prior art. With regard to Claims 14 and 15, it is respectfully submitted that Kim does not cure the deficiencies discussed above with regard to Cao, Terry and Tsunehara as originally applied to Claim 6.

Although of differing statutory class and/or scope, it is respectfully submitted that Claims 26-30 and 32, as amended, and now Claims 33-37 also patentably define over the asserted prior art for at least the same reasons discussed above with regard to Claim 1, as amended.

Consequently, in view of the present amendment and in light of the foregoing comments it is respectfully submitted that the invention defined by Claims 1-3, 5, 7-30 and 32-37, as amended, is definite and patentably distinguishing over the asserted prior art. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.


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